

WHAT IS CLAIMED IS:

1. A method of containing an intact reactor pressure-vessel head with attached control rod mechanisms for transport as radioactive materials, the method comprising:
  - 5 coating the exterior surfaces of the reactor pressure vessel head with a fixative material;
  - packaging the control rod drive mechanisms as a bundle within a protective covering;
  - attaching the reactor pressure vessel head in its upright position to a bottom plate; and
  - placing the reactor pressure vessel head within the transport container while the reactor pressure vessel head is in the a reactor containment building.
- 10 2. The method of Claim 1, wherein said reactor pressure vessel head comprises the reactor pressure vessel head of a pressurized water reactor vessel.
3. The method of Claim 1, comprising coating exterior surfaces of said pressure vessel head with sealant.
4. The method of Claim 1, wherein said filling said gap with stabilizer comprises
  - 15 substantially filling said gap with low density cellular concrete.
5. The method of Claim 41, wherein substantially filling said gap with stabilizer comprises completely filling said gap with stabilizer.
6. The method of Claim 1, wherein the transport container is suitable for transport in accordance with applicable federal regulation for radioactive materials.
- 20 7. The method of Claim 1, wherein said transport container comprises multiple modular sections.

8. The method of Claim 1, comprising filling at least a portion of said intact reactor pressure vessel head with a stabilizer.
9. A method of containing an intact reactor pressure vessel head with attached control rod driving mechanisms for transport as radioactive materials, the method comprising:
  - 5 using a multi-piece universal container to permit access of the container parts into the building containing the reactor;
  - using a two-piece bottom plate to permit unencumbered shipment from fabricator and to provide access into the building containing the reactor; and
  - sealing the container using a series of flanged and gasketed surfaces.
- 10 10. The method of Claim 9, comprising coating exterior surfaces of said intact reactor pressure vessel head with sealant.
11. The method of Claim 9, wherein said filling said gap with stabilizer comprises substantially filling said gap with low density cellular concrete.
12. The method of Claim 9, comprising sealing said canister.
- 15 13. The method of Claim 9, wherein said reactor pressure vessel head is the reactor pressure vessel head of a pressurized water reactor vessel.
14. The method of Claim 9, comprising filling at least a portion of said intact reactor pressure vessel head with a stabilizer.
15. The method of Claim 9, wherein substantially filling said gap with stabilizer comprises  
20 completely filling said gap with stabilizer.

16. A method of sealing the joints of a container for an intact reactor pressure vessel head with attached control rod driving mechanisms using a gasket configurations that provide for gamma shielding, the method comprising:

defining the joints perpendicular to the container axis with semicircular steel plates  
5 welded to the container section flanges;

defining the joints parallel to the container axis with rectangular steel plates welded to the container section flanges;

locating the circular steel plates used for sealing inside the diameter of the rectangular steel plates used for sealing.

10 16. The method of Claim 16, comprising coating an interior surface of said intact reactor pressure vessel head with sealant.

17. The method of Claim 16, comprising substantially filling a gap between the interiors of said container and said intact with reactor vessel head with a stabilizer.

18. The method of Claim 16, wherein said filling said gap with stabilizer comprises  
15 substantially filling said gap with low density cellular concrete.

19. The method of Claim 18, wherein substantially filling said gap with stabilizer comprises completely filling said gap with stabilizer.

20. The method of Claim 18, further comprising removing any external parts at least to the extent that said parts protrude further from said reactor pressure vessel head than an outer  
20 perimeter of a head-to-body joint flange.

21. The method of Claim 16, comprising filling at least a portion of said intact reactor

pressure vessel head with a stabilizer.

22. The method of Claim 16, wherein said intact reactor pressure vessel head comprises the reactor pressure vessel head of a pressurized water reactor vessel.

24. The method of Claim 16, wherein said container and gasket configuration are appropriate for transport in accordance with federal regulations for radioactive materials.

25. Apparatus for the containment and transport of an intact reactor vessel pressure head with attached control rod driving mechanisms as radioactive materials, the apparatus comprising:

a plurality of half circular sections attached to each other and to the intact reactor vessel pressure head;

a two piece bottom plate attached to the pressurized water reactor vessel head with a corner configuration adapted to minimize and/or absorb shocks; and

a plurality of protuberances surrounding the reactor pressure vessel head to absorb shock.

26. The apparatus of Claim 25, wherein said reactor pressure vessel head comprises the reactor pressure vessel head of a pressurized water reactor vessel.

27. The apparatus of Claim 26, wherein said apparatus is appropriate for transport in accordance with federal regulation for radioactive materials.

28. The apparatus of Claim 26, wherein said plurality of half circular sections are attached to each other in series.

29. The apparatus of Claim 26, further comprising a stabilizer, which is introduced in a gap between said interior of said canister and said intact radio pressure vessel head.

30. The apparatus of Claim 26, wherein said reactor pressure vessel head comprises a head-

to-body attachment.

31. The apparatus of Claim 30, wherein said reactor pressure vessel head is attached to said bottom plate.

32. The apparatus of Claim 26, wherein said apparatus comprises a canister when assembled.

5 33. A method of fabricating a containment vessel for use in removing an intact reactor pressure vessel head with attached control rod driving mechanisms from a nuclear power plant site, the method comprising:

fabricating a containment vessel including plurality of semi-circular and flanged bodies, having respective cross sections of sufficient dimensions to accommodate the reactor pressure vessel head, from structural sheet steel material;

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dividing said bodies of said containment vessel into a plurality of respective groups of half cylinder sections, each group of half cylinder sections suitable for transit through a reactor containment building access hatch;

transporting said half cylinder sections to the power plant site in a routine manner via truck; and

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transporting a two piece bottom plate to the power plant site in a routine manner via truck.

34. The method of Claim 33, wherein said bodies are assembled in series to form a tubular body inside said reactor containment building vessel.